# City of Atlanta CSO Remedial Measures Authorized Plan

**Mayor's Clean Water Advisory Panel Briefing**

**June 28, 2002**

# Briefing Agenda – Part 1

- History of CSOs in Atlanta
- Regulatory Issues

ORIGINAL

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

FILED IN OPEN COURT
U.S.D.C. Atlanta
SEP 24 1998
LUTHER D. THOMAS, Clerk
By: Deputy Clerk

UPPER CHATTAHOOCHEE RIVERKEEPER FUND, INC; THE CHATTAHOOCHEE RIVERKEEPER, INC; and W. ROBERT HANCOCK, Jr.,
Plaintiffs,
v.
THE CITY OF ATLANTA,
Defendant.

CIVIL ACTION FILE
NO. 1:95-CV-2550-TWT

THE UNITED STATES OF AMERICA AND THE STATE OF GEORGIA,
Plaintiffs,
v.

CIVIL ACTION FILE
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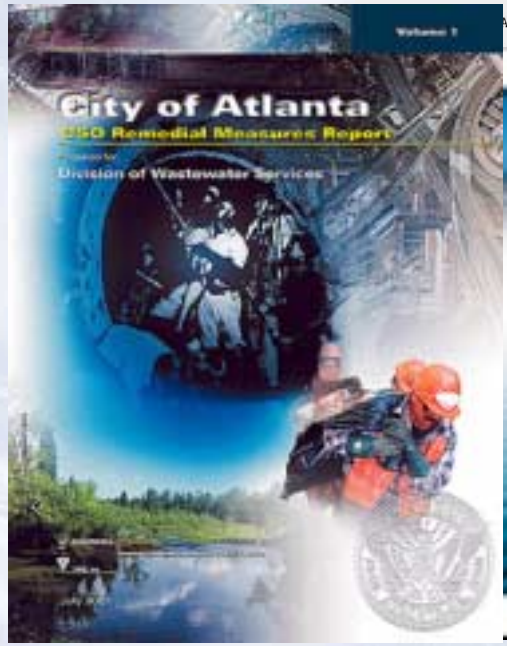
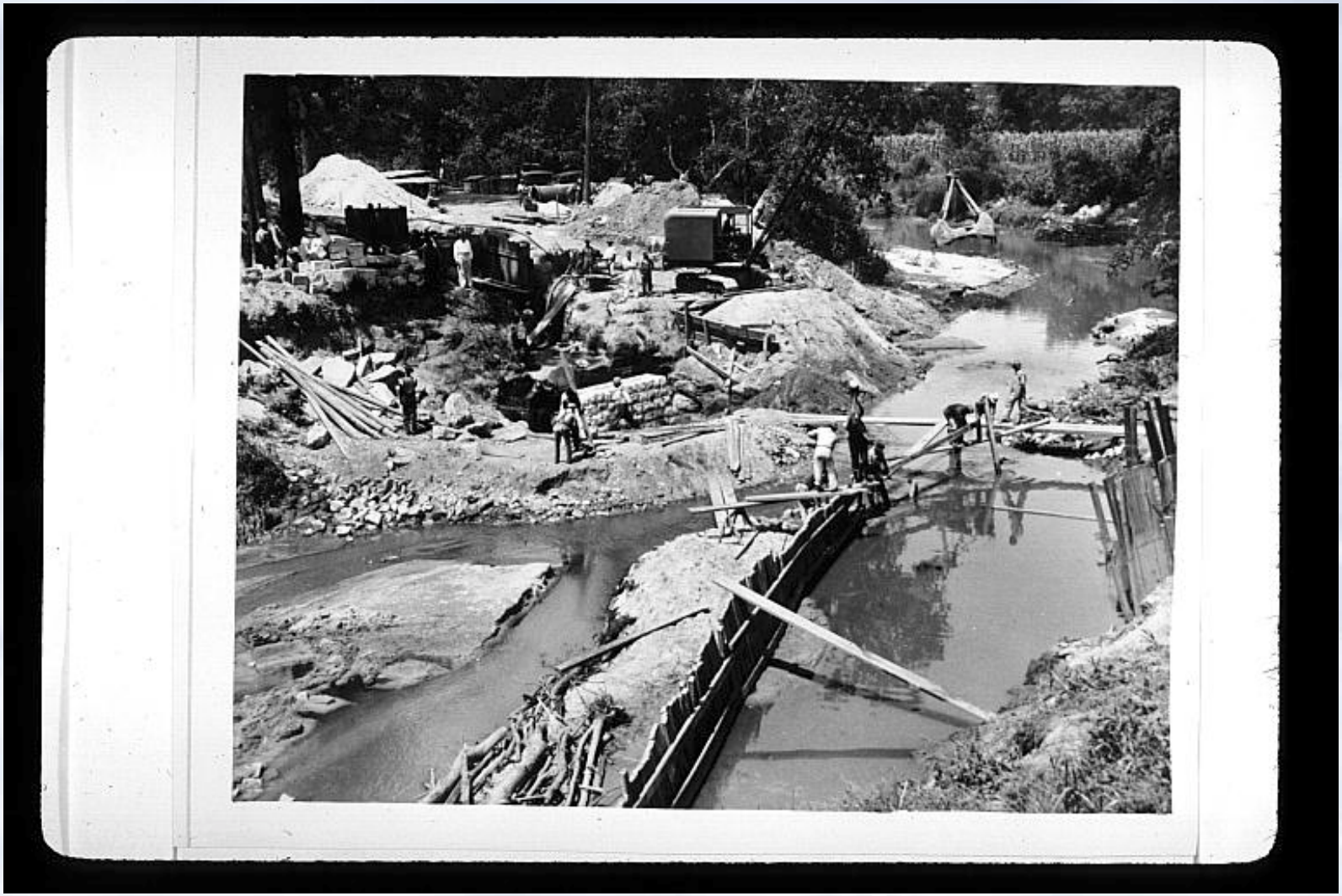



# Atlanta Has An Old System

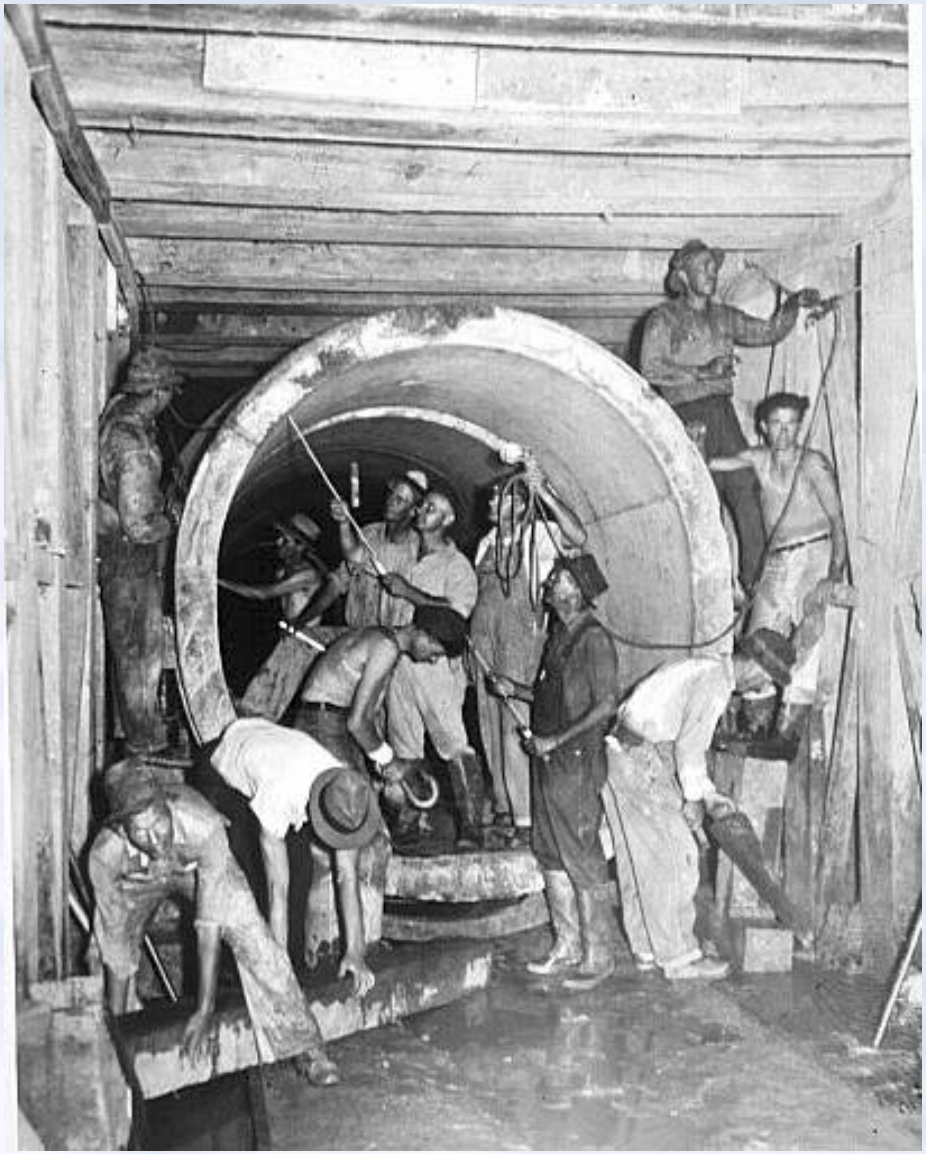
- Combined sewers completed about 1920
- Separated sewers built after 1920
- Some of Atlanta's sewers are more than 100 years old

# Late 1800's: Potable water supplies to homes increased the waste load to the streams

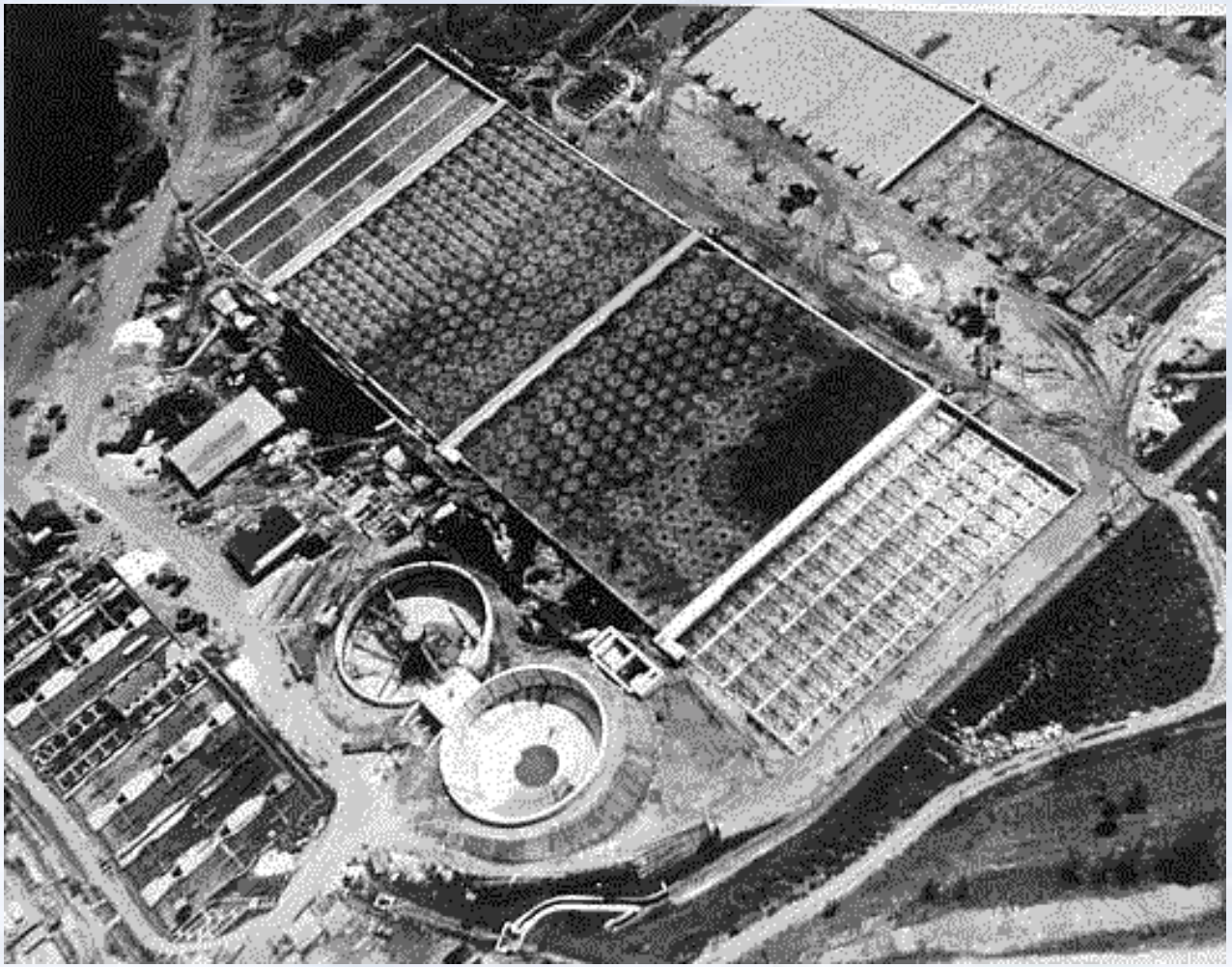


Clear Creek 1936

# Watercourses were enclosed

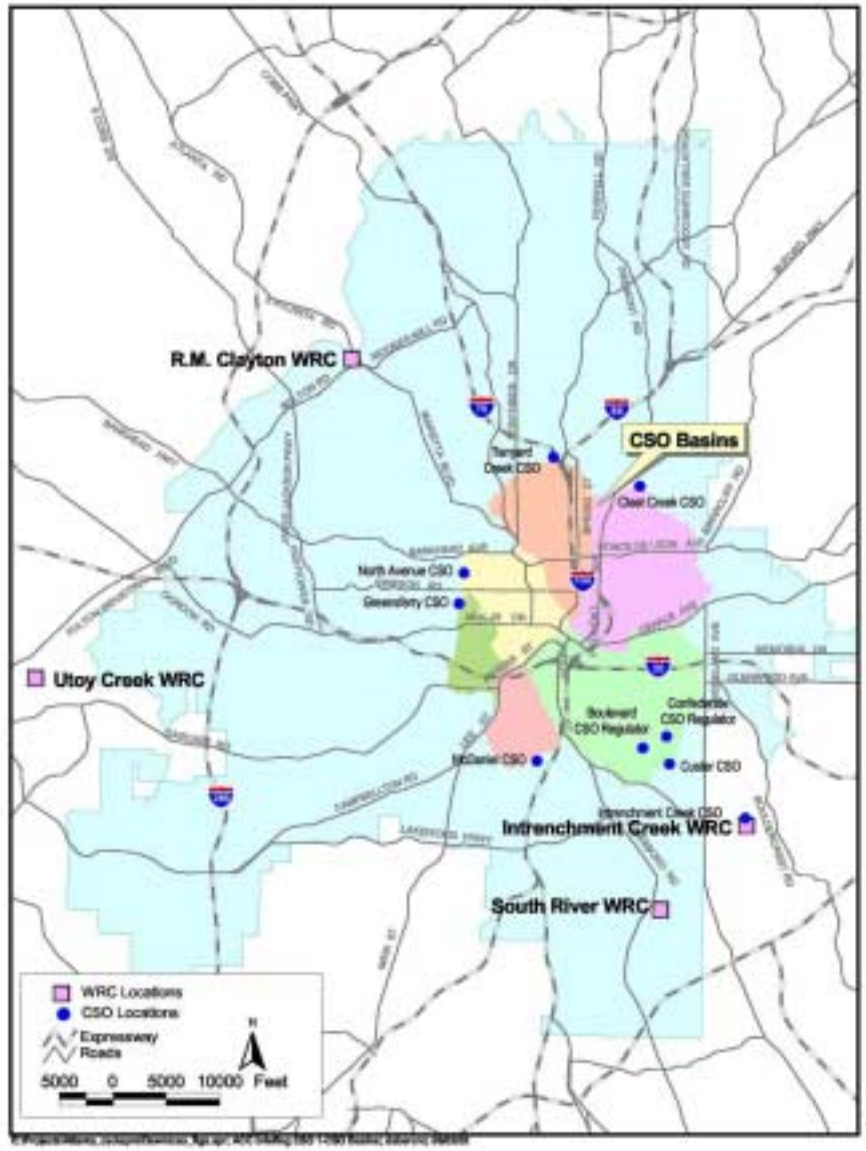


# Intrenchment Creek Sewage Treatment Plant
# First WRC Constructed in 1936

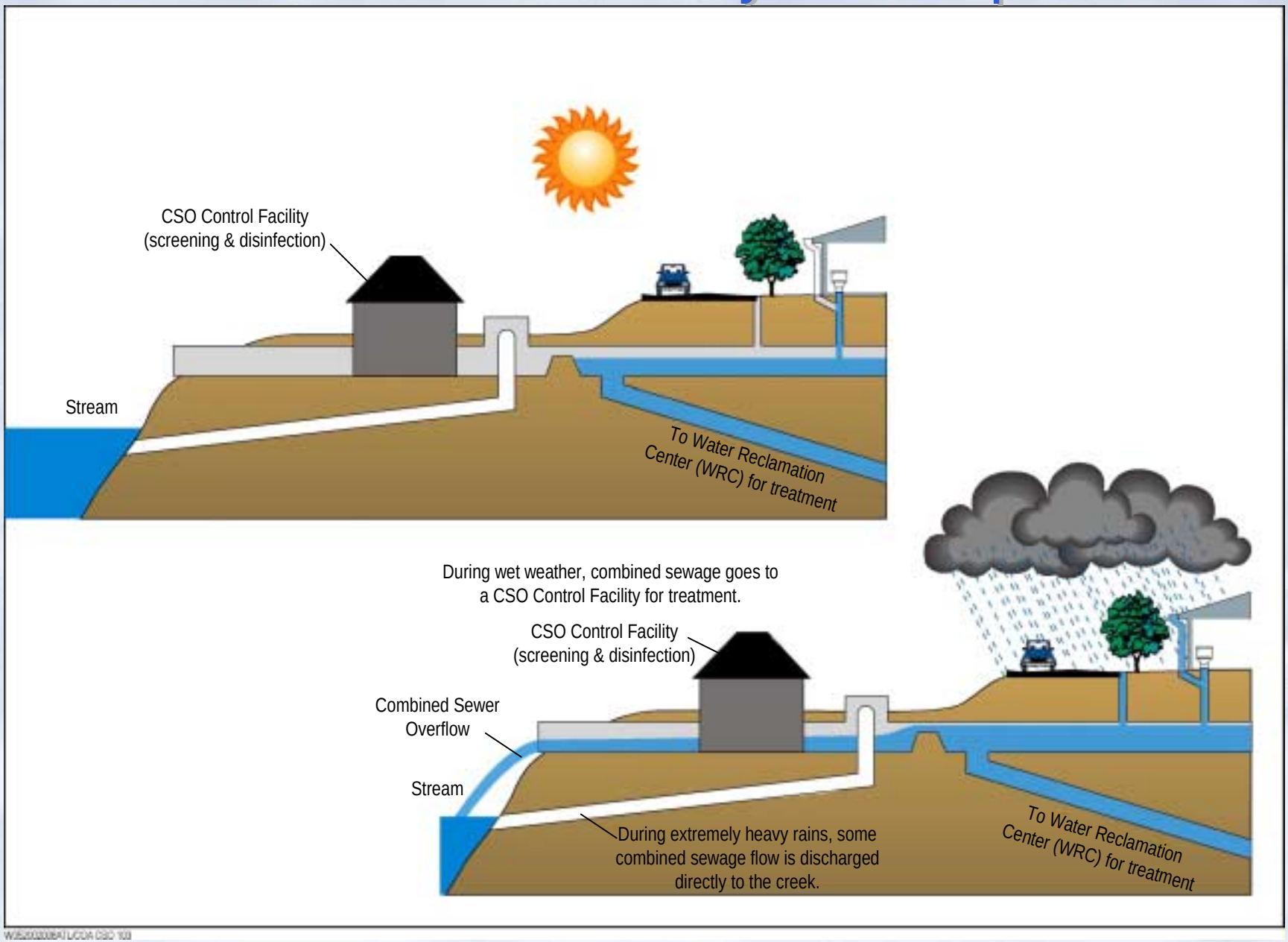


# Atlanta's Wastewater System Includes:

- 2,200 miles of sewer
- 85% separated sewers
- 15% combined sewers (330 miles – 19 square mile area)
- 4 WRCs*
- 7 CSO* Facilities + 2 Regulators



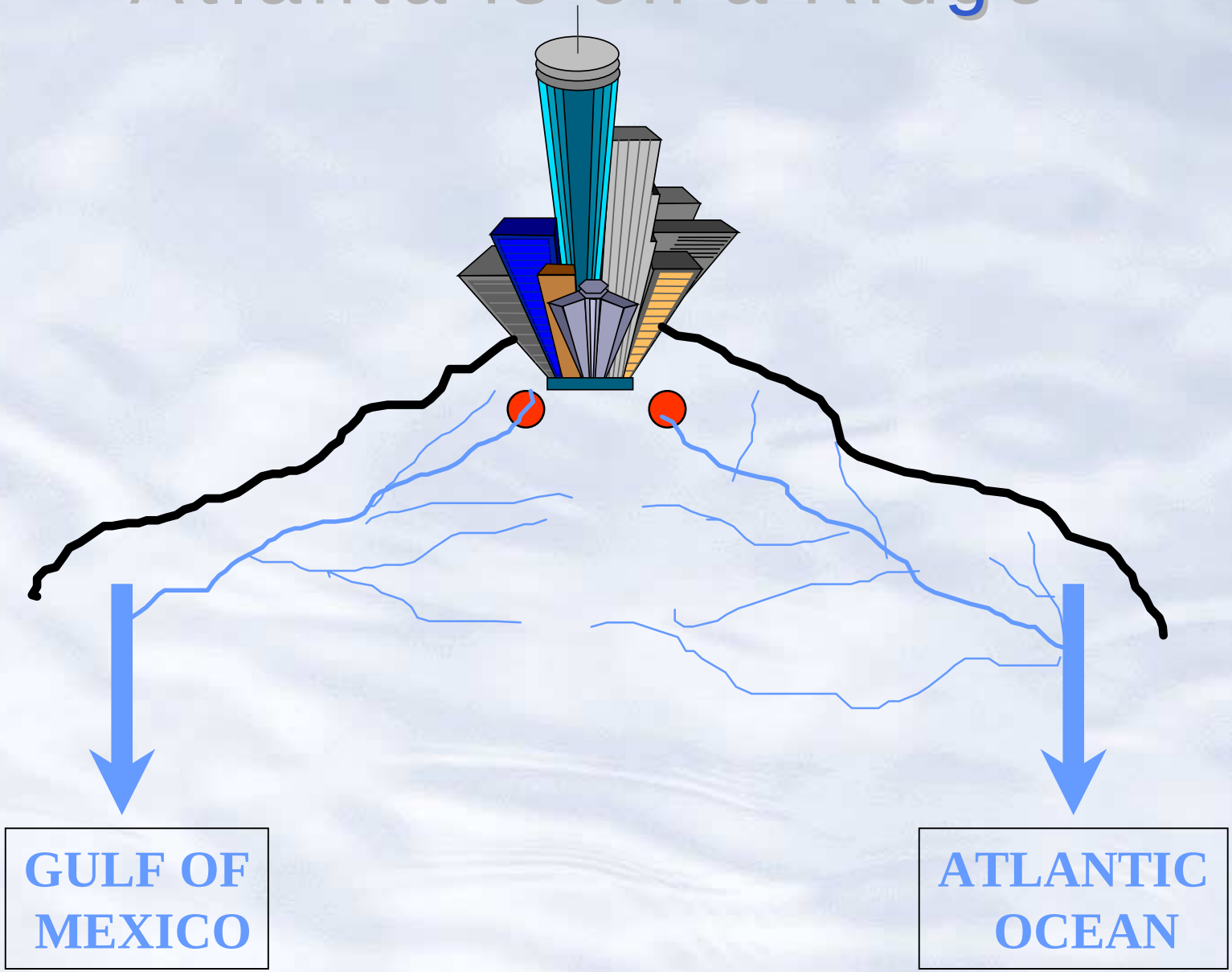
# How Atlanta's CSO System Operates



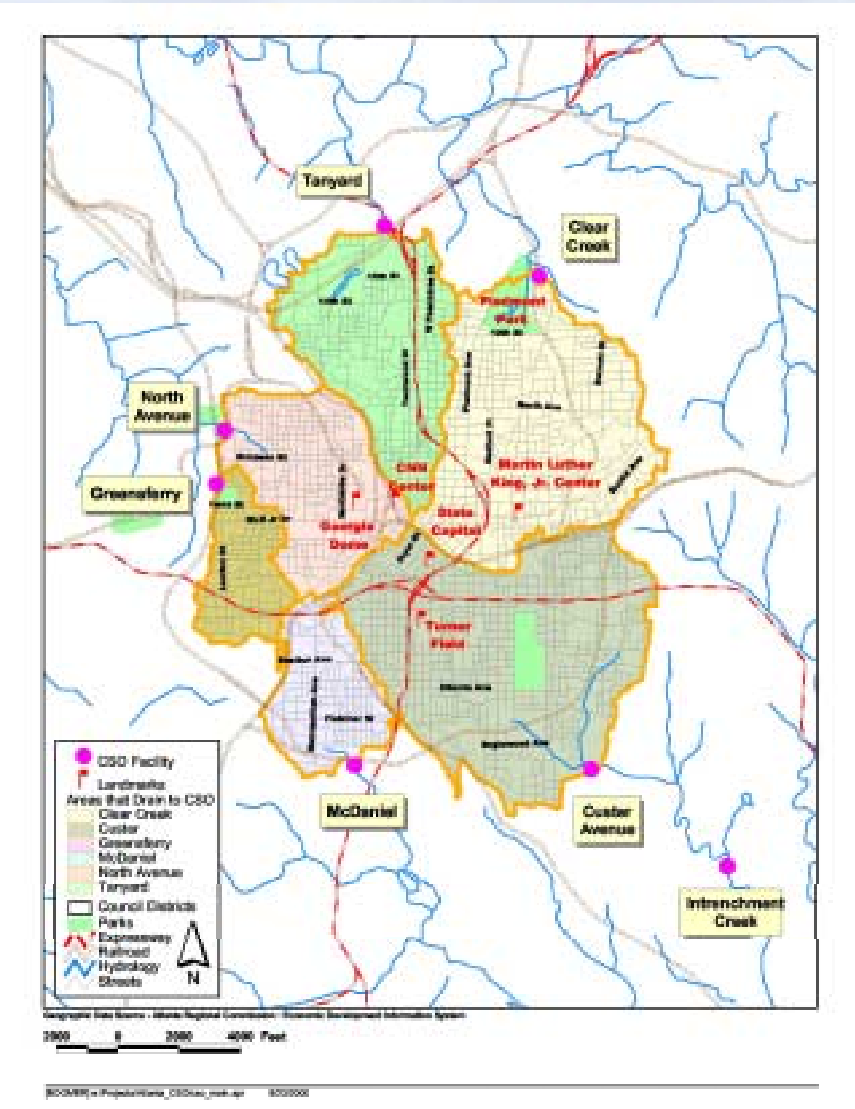
# Atlanta's CSO System Operation (cont'd)

- Combined sewers carry wastewater and stormwater (combined sewage)
- Dry weather - All wastewater goes to WRC (fully treated)
- Wet weather - Stormwater exceeds capacity of WRC and combined sewage goes to CSO facilities (disinfection & screening before discharge to nearby stream)
- Heavy rain - Combined sewage bypasses CSO facility and overflows into stream; occurs at 6 locations (60+ West side & 20+ East side per yr)

# Atlanta is on a Ridge



# Combined Sewer Area Today




- 19 square miles
- 15% of total sewered area
- 7 CSO Facilities at headwaters of 5 streams
- CSO area population: 106,400 (City – 416,000)

# CSO discharges are stream headwaters

# Most headwater streams are paved conveyances

# Headwaters of Tanyard Creek - NPDES discharge location

# Tanyard Creek 500 yards downstream

# When not paved, stream habitat is severely impaired

# Downstream, streams begin to return to more natural state

1980s: Low Dissolved Oxygen in the South River attributed to CSO discharges

# 1980's East Area CSO Projects

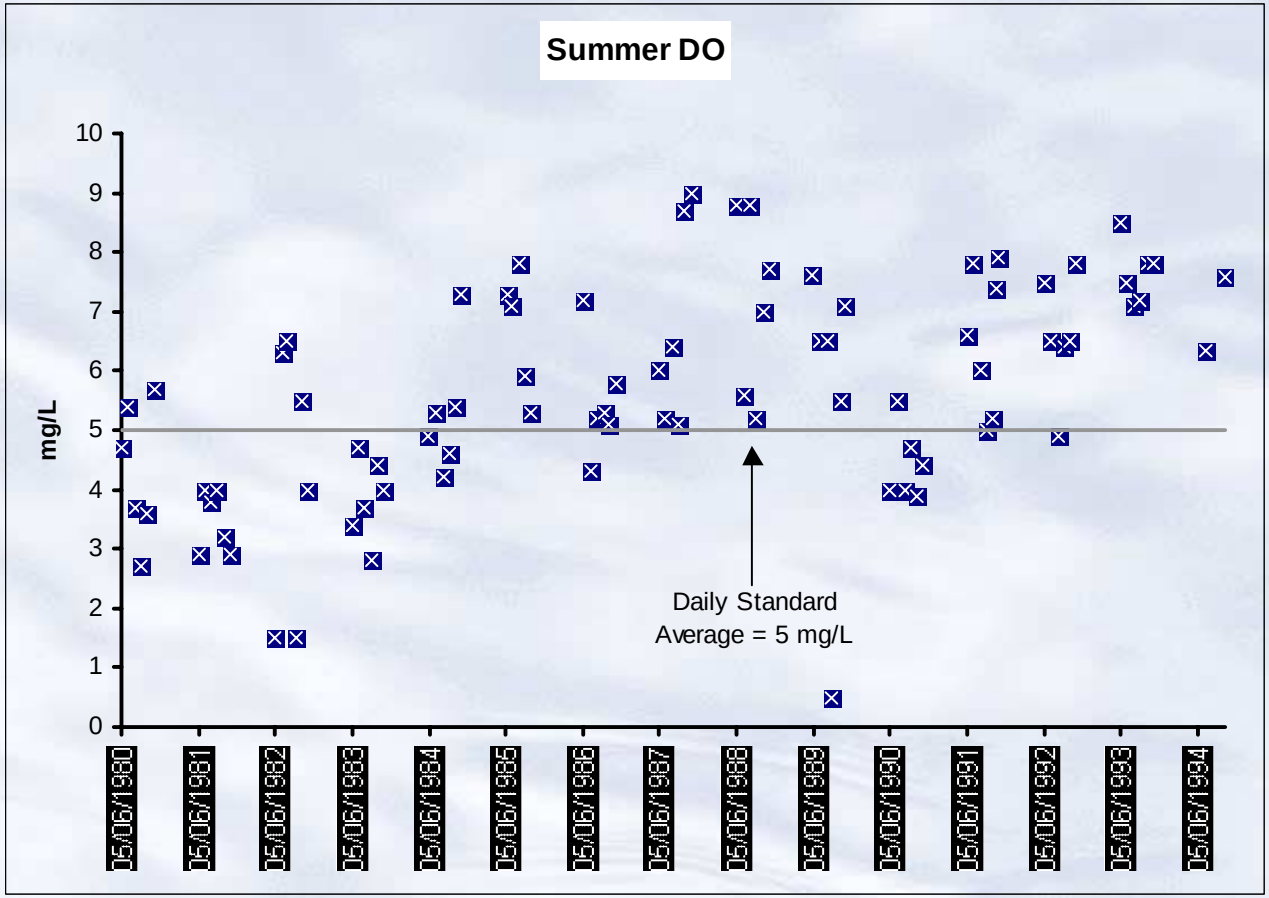
- 6 Million Gallon off-line Storage Tank at McDaniel CSO, pumped to treatment at South River WRC
- 34 million gallon deep rock tunnel to store and transport CSO to Intrenchment Creek CSO treatment facility
- First Flush Storage
- Total cost: $48 million (approx.)

# 1980's East Area CSO Projects cont'd

- Joyland separation in East Atlanta (0.3 square miles)
- Fairmont/Glidden separation in West Atlanta (0.3 square miles) - temporary
- Total Cost: $1 million (approx.)

# 1980 East Area CSO Improvements

# IT WORKED!


Summer DO
mg/L
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Daily Standard
Average = 5 mg/L
05/06/1980
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05/06/1994

# Additional CSO Control Plans

- 1988 City funds CSO management study
- 1989 - EPD issues order mandating CSOs be controlled or eliminated
- 1990 - EPD approved Atlanta's CSO management strategy for the CSOs, the strategy included screening and disinfection facilities at Tanyard, Clear, Greensferry, North Ave, and Utoy Creek.

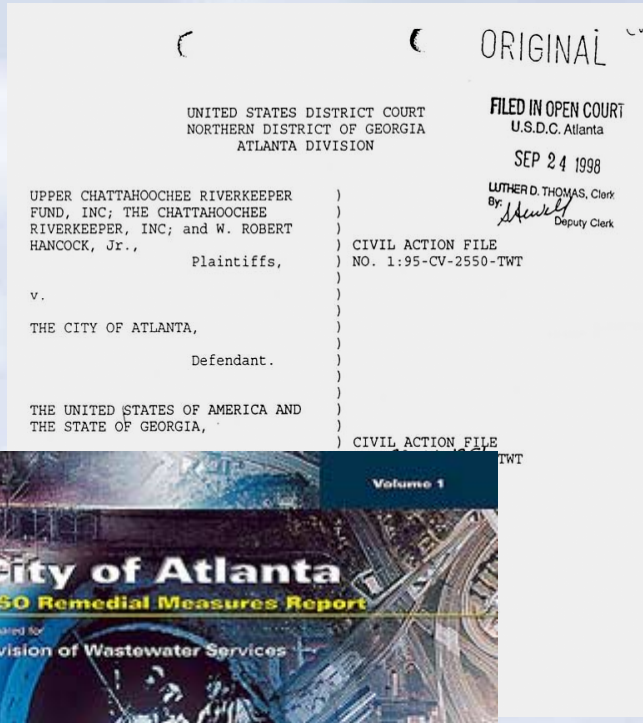
# 1990's: West Area CSO Improvements

- 1991-1993 Citizen protest prompted a change in plans for Utoy and Clear Creek facility. Stiff fines and sewer moratoria were imposed for not meeting construction deadlines.
- 1994 Tanyard, Greensferry and North Ave. CSOs complete ($19 million)
- 1997-1998 Construction of Clear Creek facility and Utoy Sewer Separation complete. ($150 million)

# 1990s West Area CSO Facilities

# Briefing Agenda – Part 2

- CSO Consent Decree
- Public Concerns
- Authorized Remedial Measures Plan



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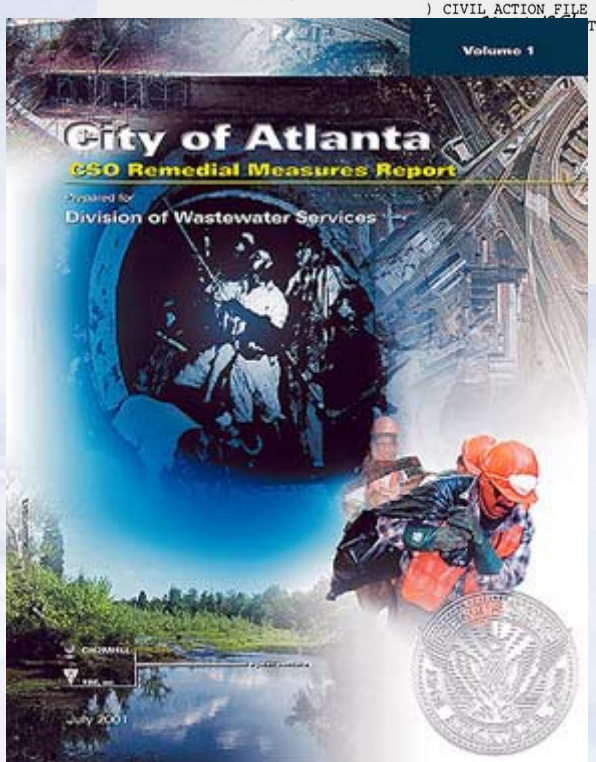


# 1989: New Georgia Law

- Specifically targeted Atlanta
- Compliance by December 31, 1993
- Discharges must meet water quality standards

# At the Same Time...

- **1994** EPA National CSO Policy
- **1995** Riverkeeper and downstream property owners file lawsuit against City, claiming that the CSO's did not meet water quality standards
- **1997** EPA audits CSOs, plants and sewers
- **1997** Judge rules that the CSOs caused violations of WQS

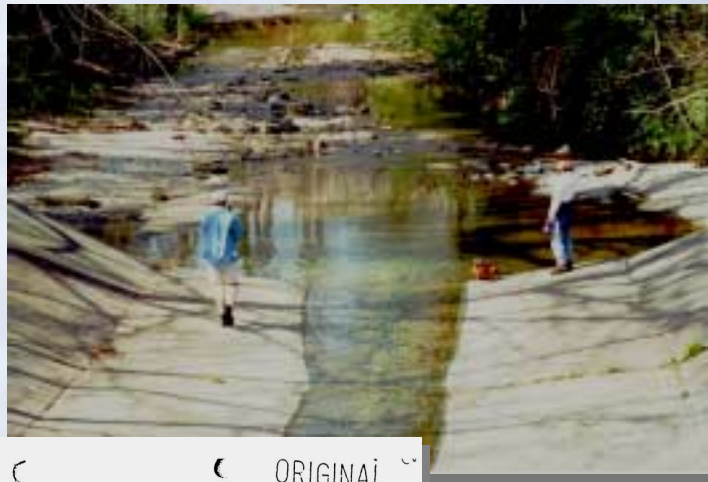
# 1994 CSO National Policy

- Characterize Sewer System and CSOs
- Demonstrate Implementation of Nine Minimum Controls
- Develop Long-Term CSO Control Plans to Evaluate Alternatives for CWA Compliance
- Presumption vs. Demonstration Approach for CWA Compliance

# 1998: City of Atlanta enters CSO Consent Decree

CSO Consent Decree

- **1995 lawsuit:** Chattahoochee Riverkeeper and downstream property owners vs. City of Atlanta
- **Agreement reached between City and:**
  - EPA
  - Department of Justice
  - State of Georgia
  - Riverkeeper
  - Downstream citizens



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CONSOLIDATED

CONSENT DECREE

# 1998 CSO Consent Decree

- **1 Year Study of CSOs**
- **CSO Maintenance,Operation & Management (MOMs) Plans**
- **Interim Disinfection Improvements**
- **Separated Area Verification**
- **SEPs – Greenway Acquisition and Stream Cleanup**
- **Remedial Measures Plan (18 Months)**
- **Construction Complete in 2007**

# Public Involvement Conducted Throughout 30-Month Evaluation Process

- First public meeting in September ‘98
- 100+ meetings through January ‘01
- Website & news coverage

- ✓ ***CSO Advisory Groups***
- ✓ ***NPUs***
- ✓ ***SAC***
- ✓ ***APAB***
- ✓ ***Concerned Black Clergy***
- ✓ ***Other community, civic and business groups***

# What did we hear from stakeholders?

"Restore the streams!"

"Fix it right once and for all!"

"No more flooding into homes from sewers!"

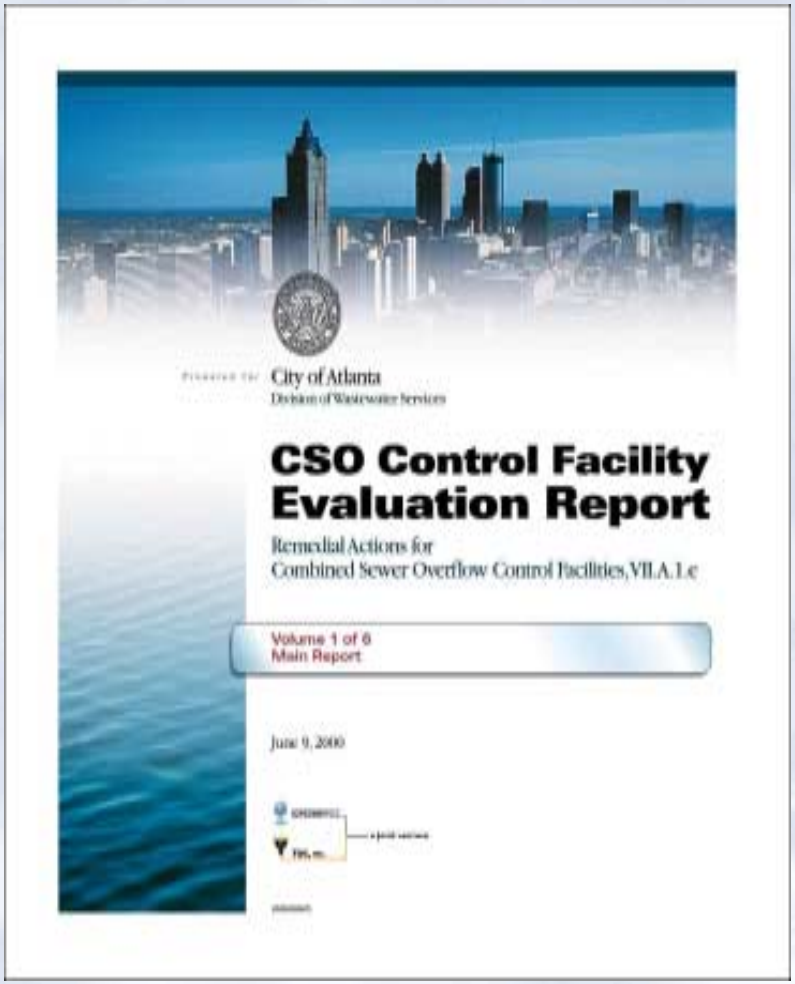
"Control development!"

"Get the sewage and storm water pollution out of the streams!"

"No more fines!"

"Separate the sewers!"

# CSO System Evaluation

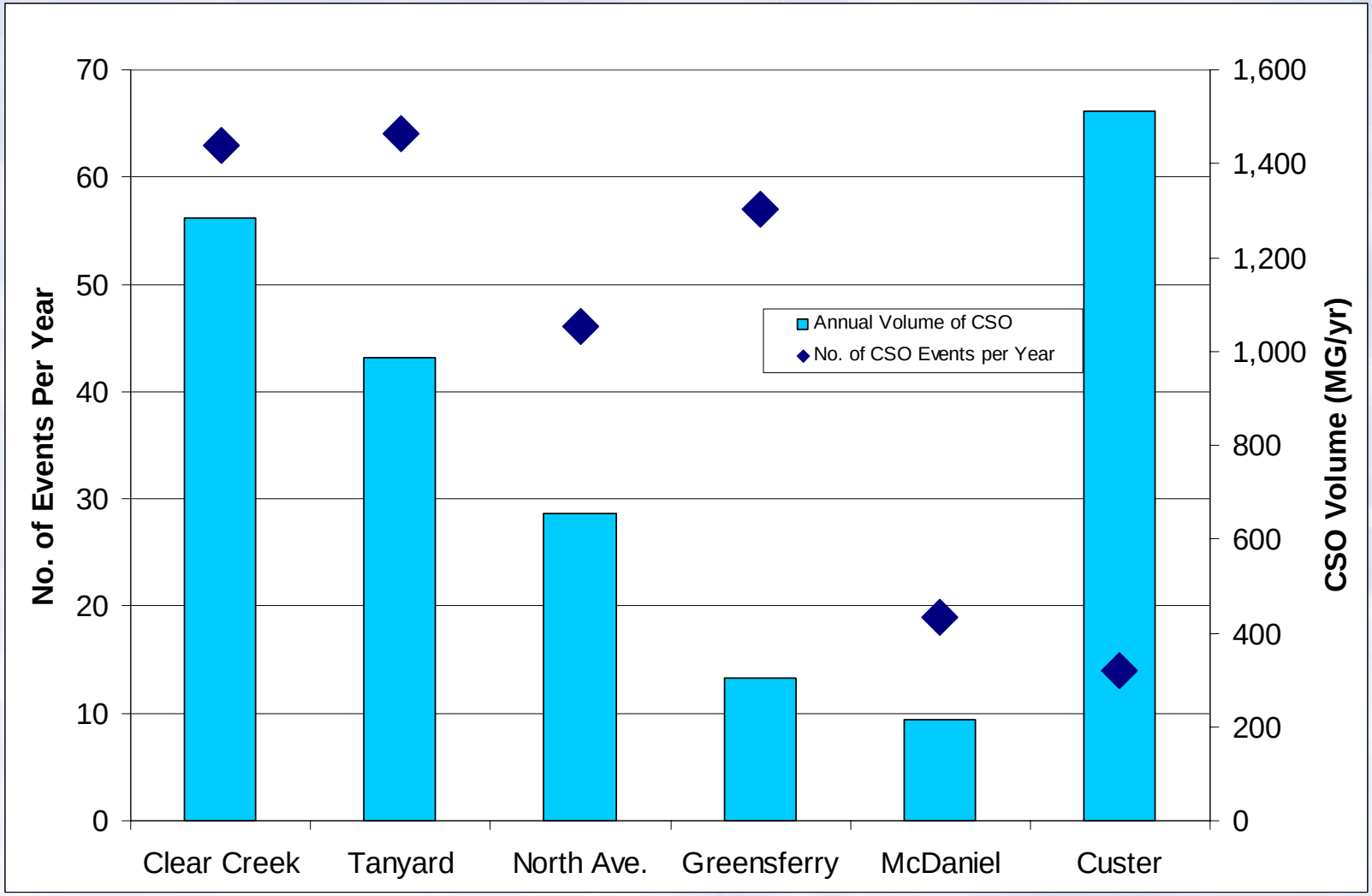



- Characterized wastewater and existing system performance
- One-year study defined water quality issues and improvement needs

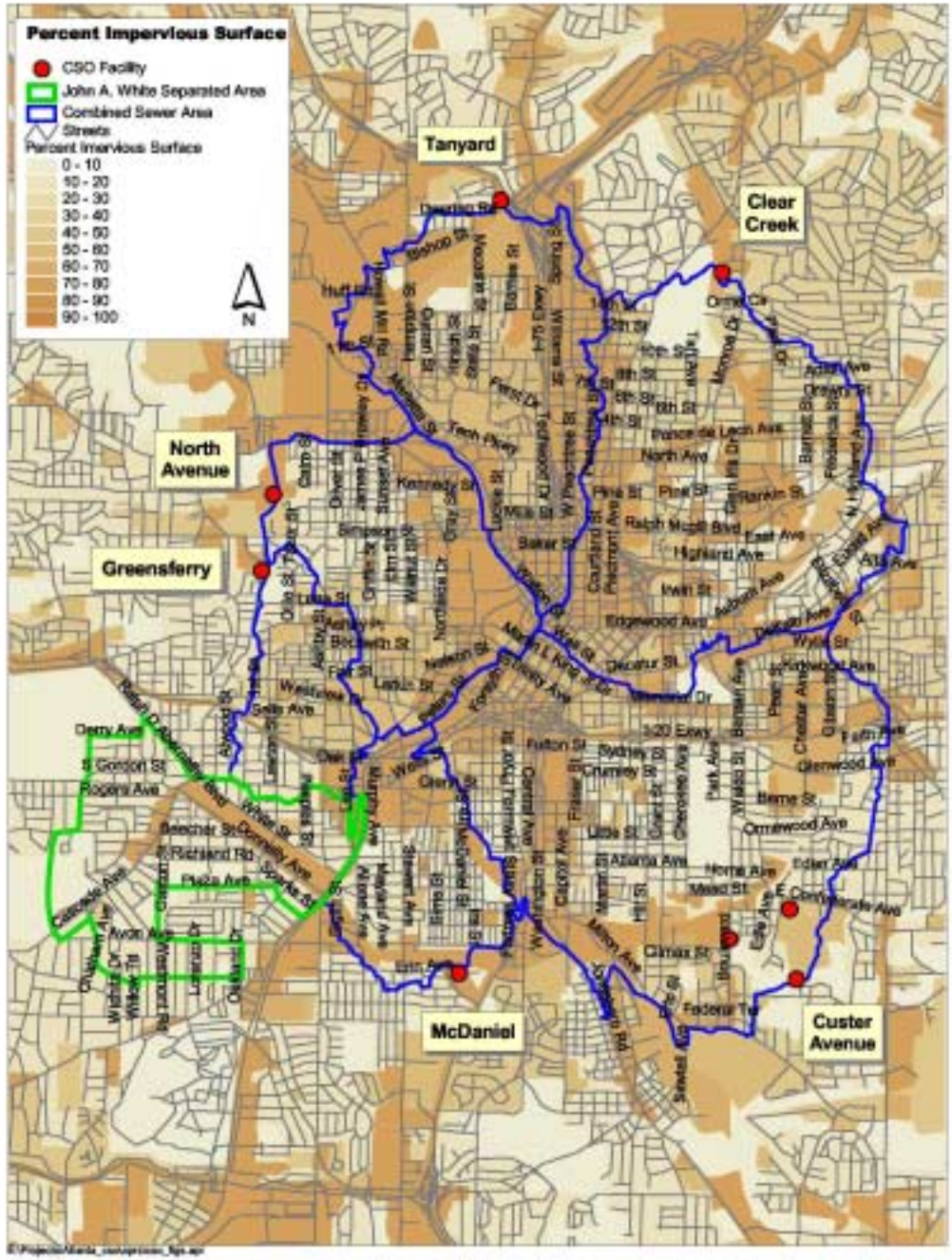
# System Evaluation Findings

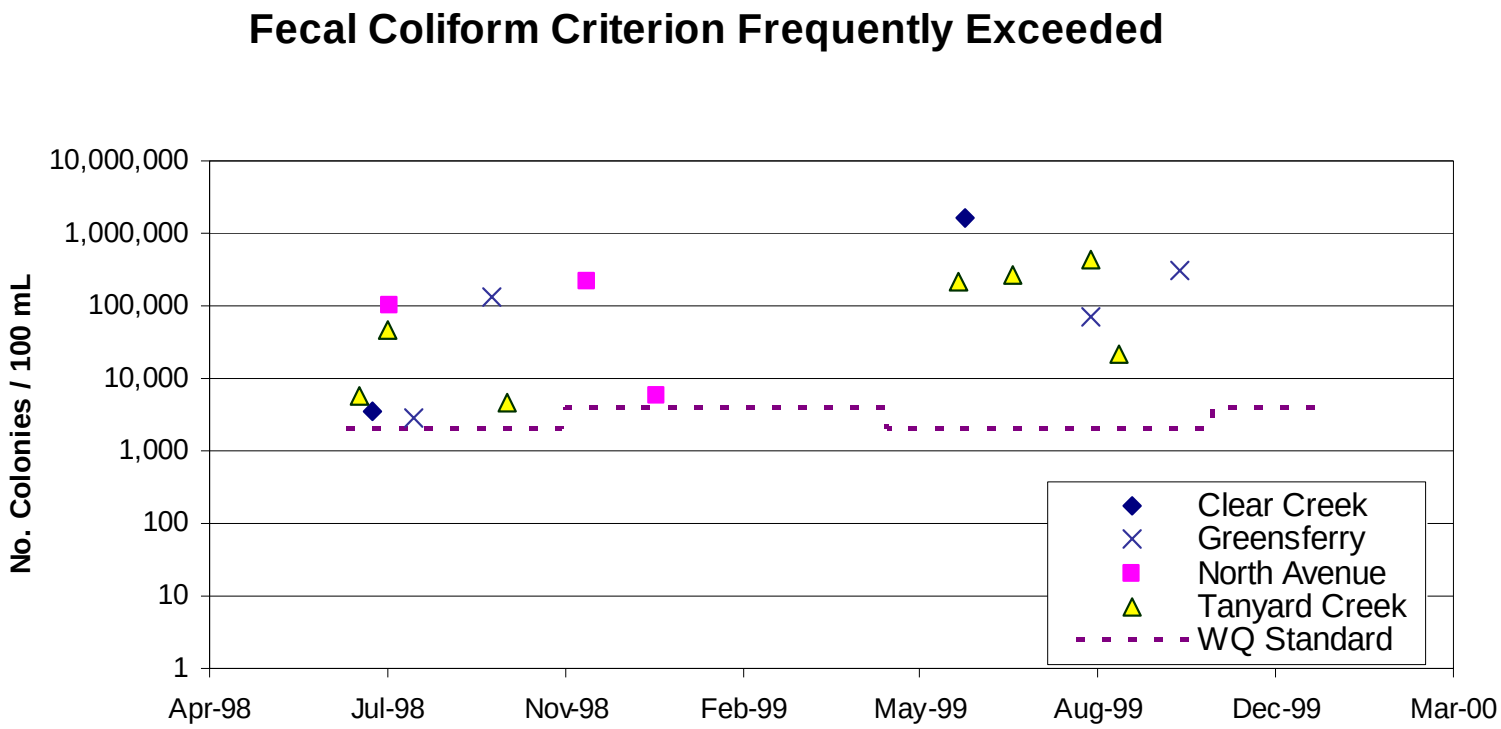
- Wastewater characteristics differ at each CSO
- Disinfection reliability improvements needed
- First flush effect not always pronounced
- Overflows not toxic, except for residual chlorine
- Zinc and copper metals of concern. Site specific studies underway
- Stormwater has elevated fecal coliform and metals concentrations

# Annual CSO Volume and Frequency



Combined sewers are located in Atlanta's most built up area - a 19-square mile area with downtown as its core.






Note: Only high values are shown.

# Many CSO Control Technologies Were Reviewed

- Sewer Separation
- Inflow Reduction Techniques
- Source Controls
- Sewer System Optimization
- Storage Systems
- Treatment Systems

# CSO Control Alternatives Considered at Each CSO Basin

- Full Basin Sewer Separation
- Partial Separation with Storage & Treatment
- Consolidated Storage and Treatment
- High-rate Primary Treatment
- BMPs (non-structural, e.g., street sweeping, sewer flushing, etc.)

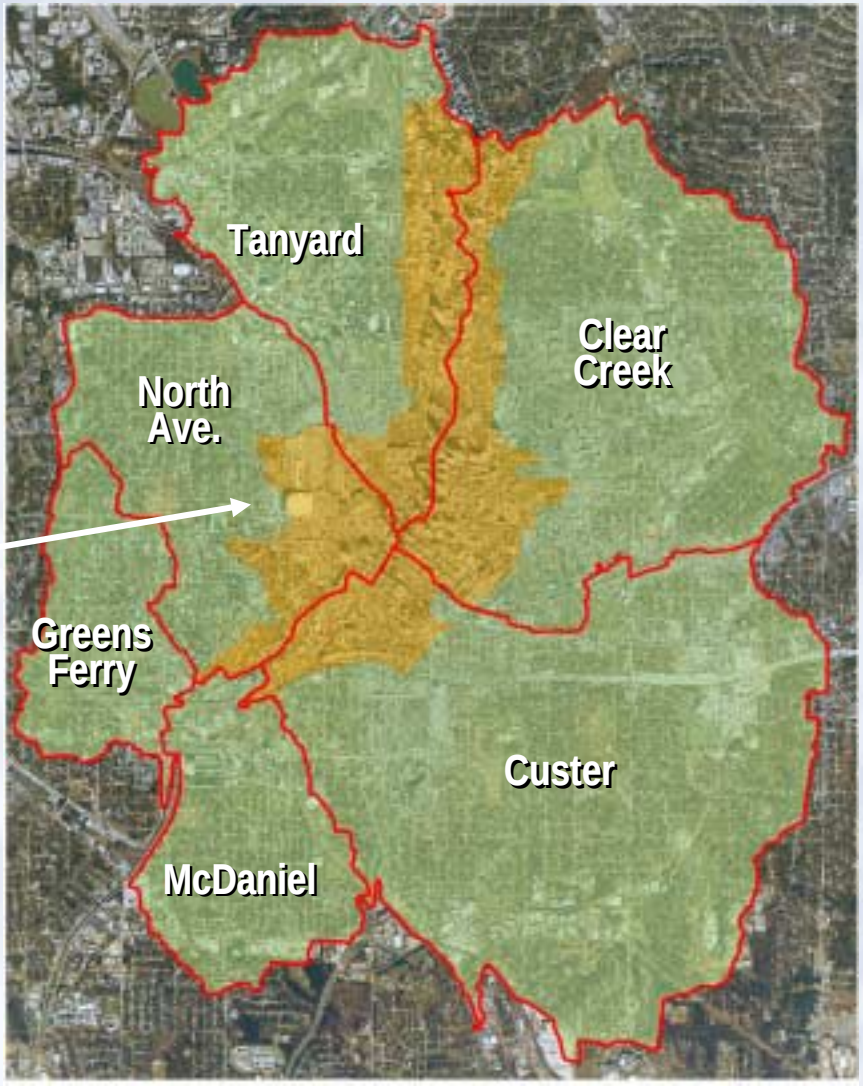
# Options Presented to EPA/EPD

Options were a hybrid of alternatives evaluated for each basin:

- Sewer separation in all 6 basins excluding the urban core (80% separation)
- Tunnel storage & treatment system (0% separation)
- Combination of separation and tunnel storage & treatment (27% separation)

# Option A: Sewer Separation

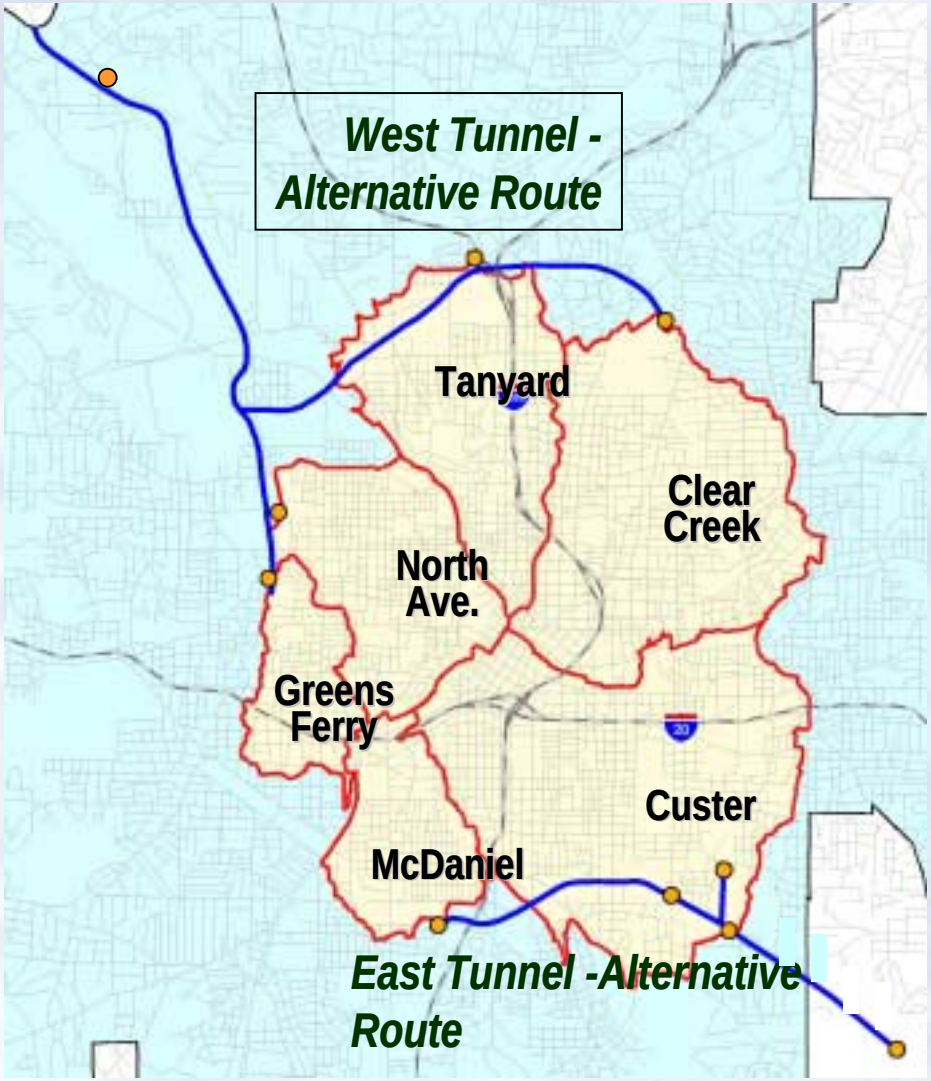
Excluding the urban core



# Option A

A. Sewer separation in all 6 basins excluding the urban core
   - 2-pipe system (wastewater and stormwater)
   - Wastewater to WRCs for treatment; separated stormwater to streams (no treatment)
   - Eliminates all 6 existing CSO facilities
   - Combined sewage from urban core stored and treated at WRC with potential for four overflows per year
   - Cannot be constructed by 2007

# Option B: Tunnel Storage & Treatment Plants



# Option B

B. Tunnel storage & treatment system

- Captures 98% of sanitary sewage flow & 85% of stormwater flow
- Stores and carries combined flow to new treatment facilities (near secondary level treatment)
- Discharges treated flow to Chattahoochee or South Rivers
- Complies with National Policy - limits overflows to 4 per yr/avg. (screened, disinfected and dechlorinated)
- Can be constructed by 2007

# Option C: Partial Sewer Separation (27%), Tunnel Storage & Treatment Plants

# Option C

C. Combination of separation and tunnel storage & treatment

- Captures 98% of sanitary sewage flow & 85% of stormwater flow
- Stores and carries combined flow to new treatment facilities (near secondary level treatment)
- Discharges treated flow to Chattahoochee or South Rivers
- Complies with National Policy - limits overflows to 4 per yr/avg. (screened, disinfected and dechlorinated)
- Includes separation in each basin, totaling approximately 27% of combined area
- Separated stormwater directed to storage and treatment
- Can be constructed by 2007

# CSO Improvement Options & Decision Criteria

## Options

- Sewer separation (except for urban core)
- Tunnel storage & treatment plants
- Partial sewer separation / tunnel storage & treatment plants

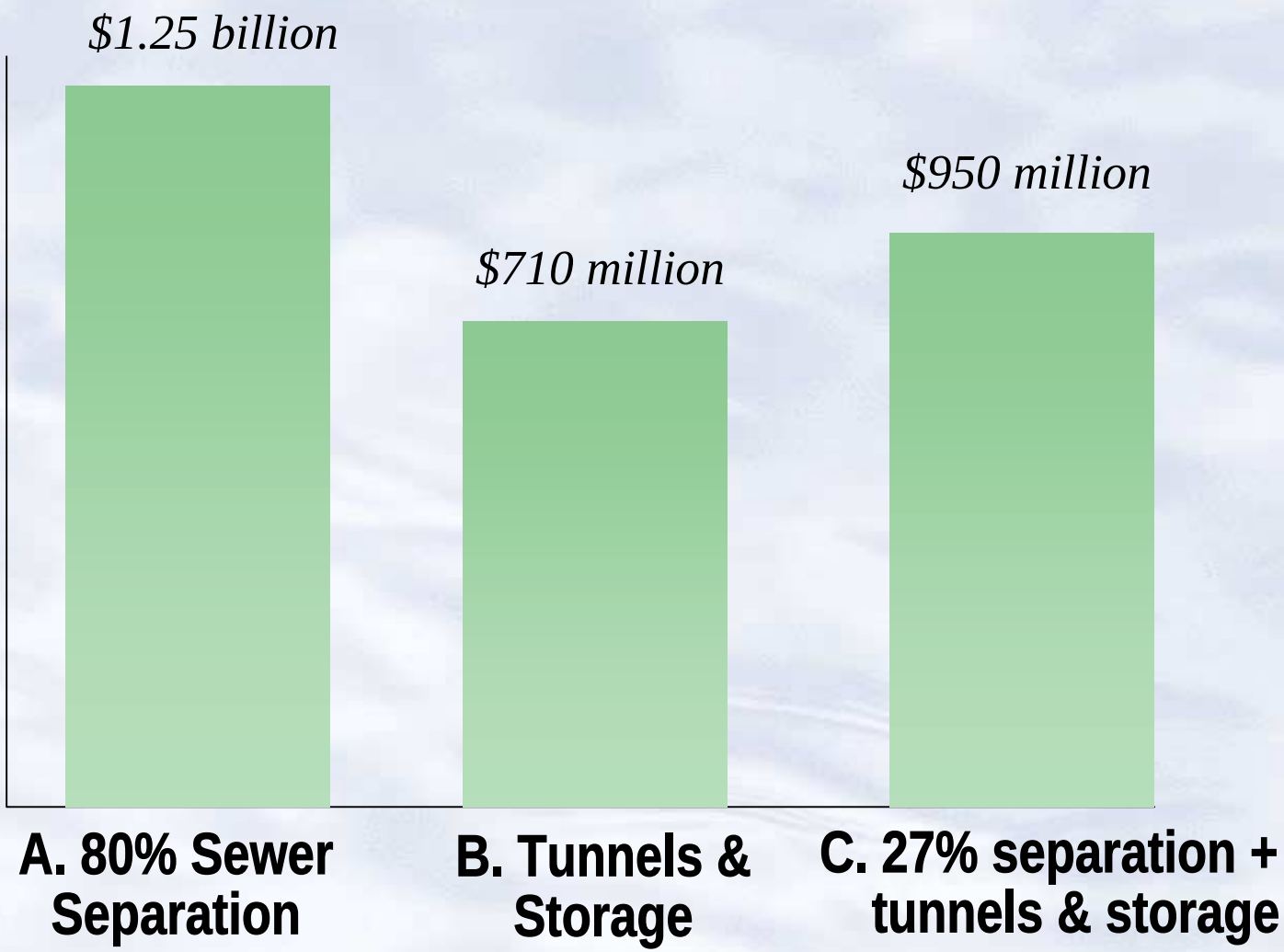
## Decision Criteria

- Consent decree deadline
- Affordability
- Water quality standards
- Acceptability

# How Did the 3 Options Compare?

| | *Compliance* | *Affordability (Rates Increase)* | *Pollutant Reduction* | *Public Acceptance* |
|---|---|---|---|---|
| **Option A – 80% Separation & Tunnel Storage/Treatment** | **NO (cannot be completed by 2007)** | **LEAST** | **LEAST** | **HIGH** |
| **Option B – 0% Separation & Tunnel Storage/Treatment** | **YES** | **MOST** | **GREATEST** | **MEDIUM** |
| **Option C - 27% Separation & Tunnel Storage/Treatment** | **YES** | **MEDIUM** | **NEXT GREATEST** | **MEDIUM** |

# Capital Cost of CSO Options

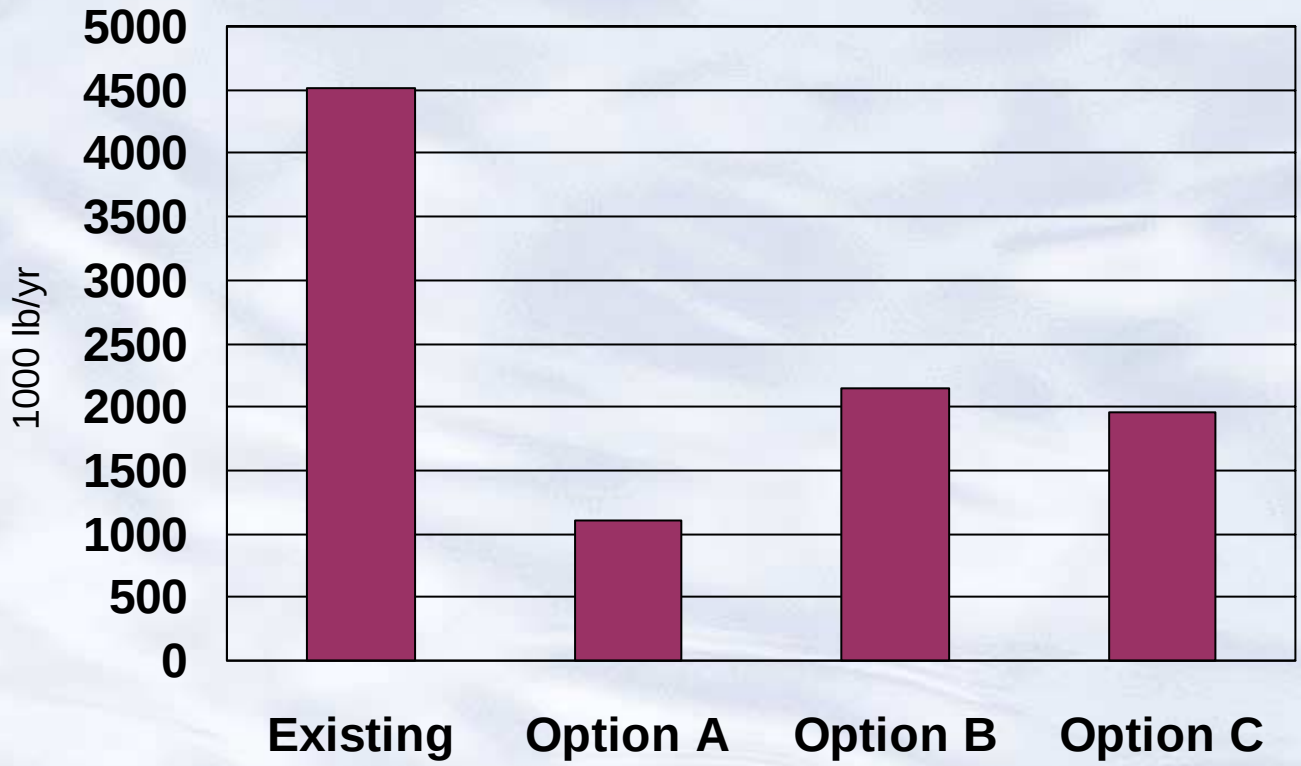


# How Did the 3 Options Compare for Pollutant Reduction?

| Water Quality Impact<br>Overall Reduction | Option A<br>80% Separation<br>Remaining CSO expected to meet WQ stds. | Option B<br>0% Separation<br>Remaining CSO expected to meet WQ stds. | Option C<br>27% Separation<br>Remaining CSO expected to meet WQ stds. |
|---|---|---|---|
| BOD | 75% | 52% | 57% |
| TSS | 60% | 75% | 74% |
| TP | 64% | 78% | 76% |
| Cu | 67% | 67% | 67% |
| Zn | 29% | 47% | 40% |

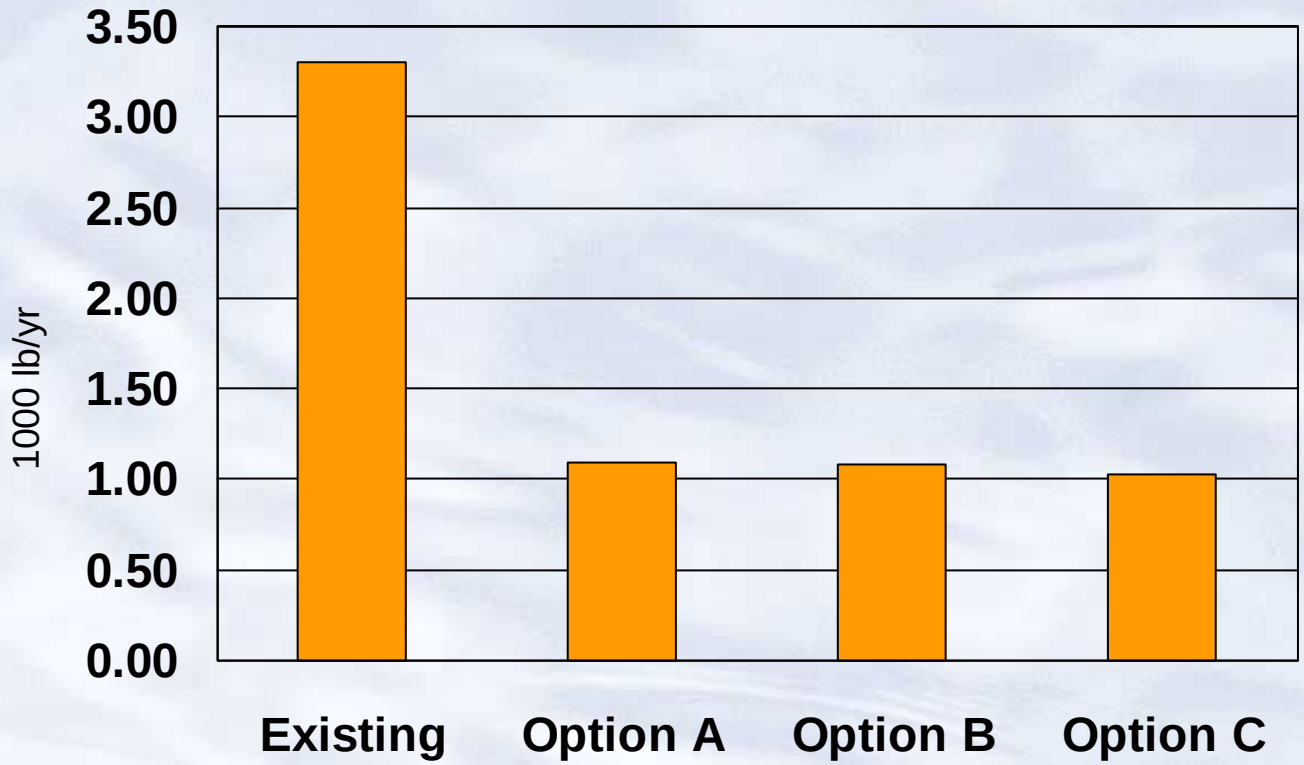
**Pollutant reduction takes into account treatment of all wastewater.**

# Pollutant Load at Local Streams - BOD



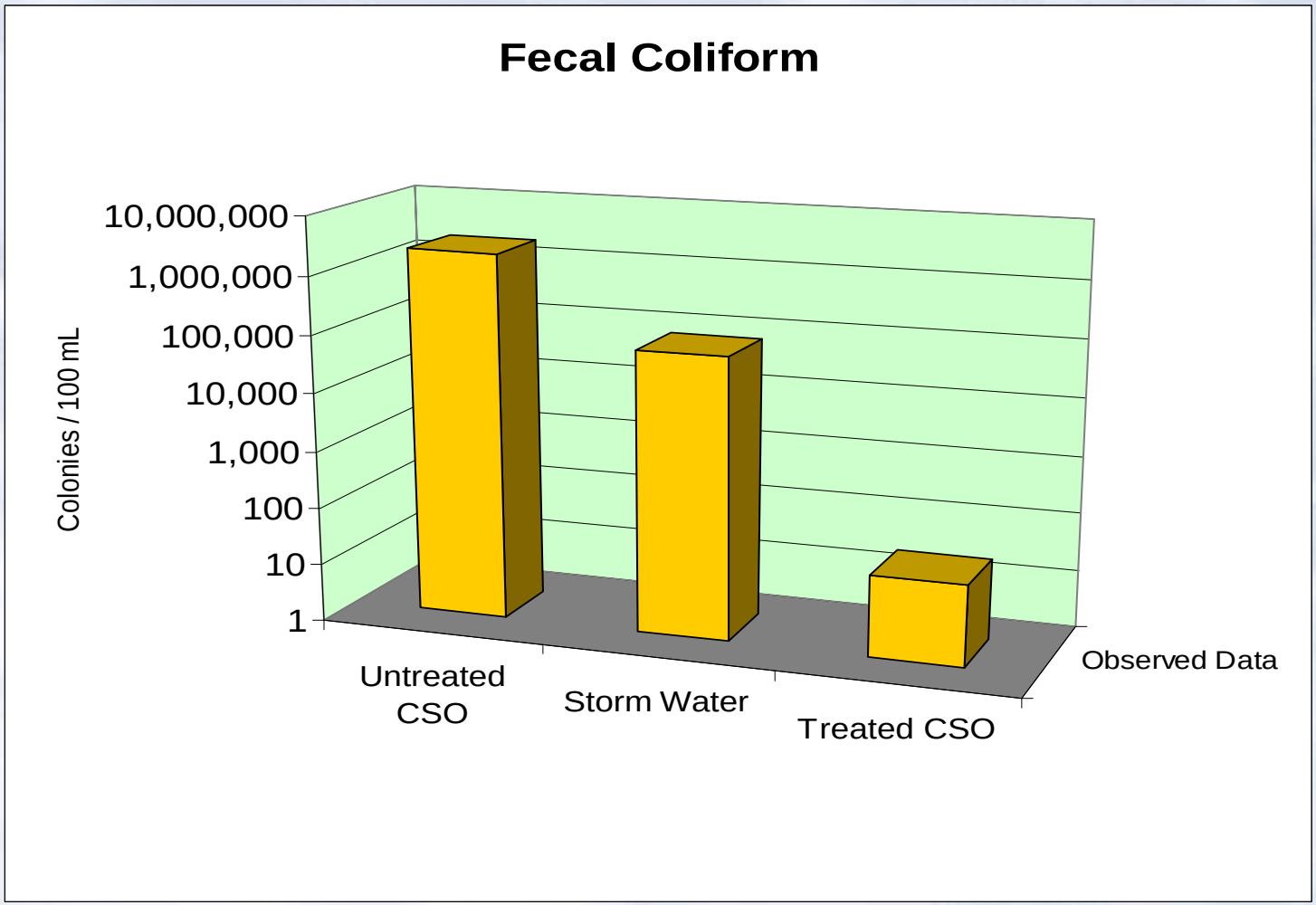
# Pollutant Load at Local Streams – Total Phosphorus

# Pollutant Load at Local Streams - Copper



# Pollutant Load at Local Streams - Zinc

# Fecal Coliform Reduction



# Pollutant Removal Overall

| | Total Removed (1,000 lbs/yr) | | | | |
|---|---|---|---|---|---|
| | BOD | TSS | TP | Cu | Zn |
| 80% Separation, storage & treatment of core area (Option A) | 3,400 | 8,740 | 13.7 | 2.2 | 4.5 |
| 0% Separation, Consolidated storage & treatment (Option B) | 2,360 | 10,800 | 16.8 | 2.2 | 7.2 |
| 25% Separation, with Tunnels & Dedicated Treatment (Option C) | 2,550 | 10,800 | 16.6 | 2.3 | 6.2 |

# Authorized CSO Plan

- 27% of combined sewers separated
- Consolidated storage (tunnels)
- Two dedicated CSO treatment plants
- Achieves CD requirements (avg. 4 CSOs/yr; complete by 2007)
- $950 million capital cost

Sewer separation involves going beneath the street surface to install new sewer pipe alongside the existing combined pipe.

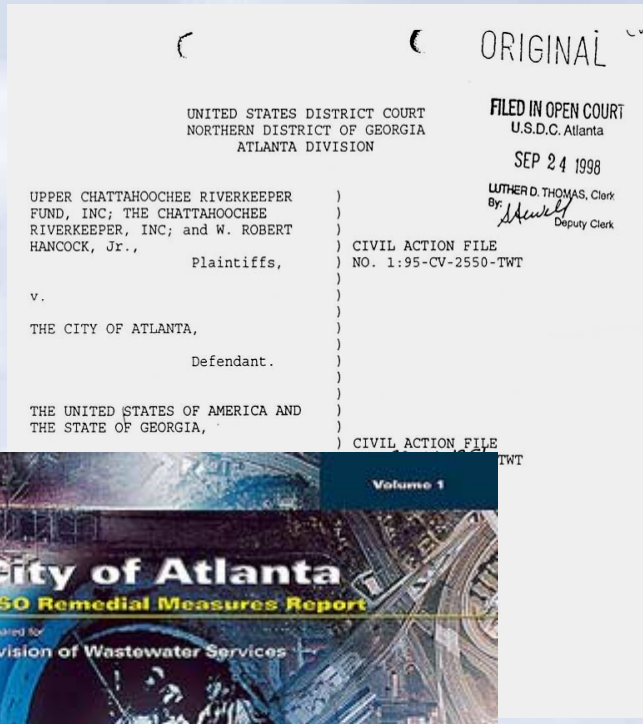
Orme Street Tunnel (under construction)

# Why Was City's Plan Selected?

- Achieves all federal and state water quality standards – (limits CSOs to 4 per year)
- Most cost effective overall approach
- Can be completed by 2007
- Reflects citizen advisory group opinion by initiating sewer separation
- Reduces overall pollutant load to local streams
  - Treats 98% of wastewater
  - Treats 85% of stormwater

# Briefing Agenda – Part 3

- Predesign Schedule
- Refining the Authorized Plan
- Affordability Analysis
- Stormwater Management
- Next Steps



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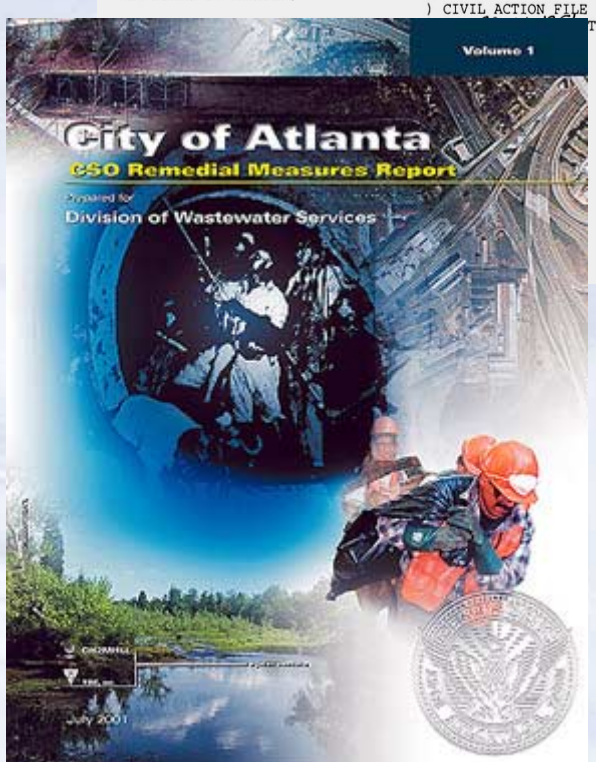
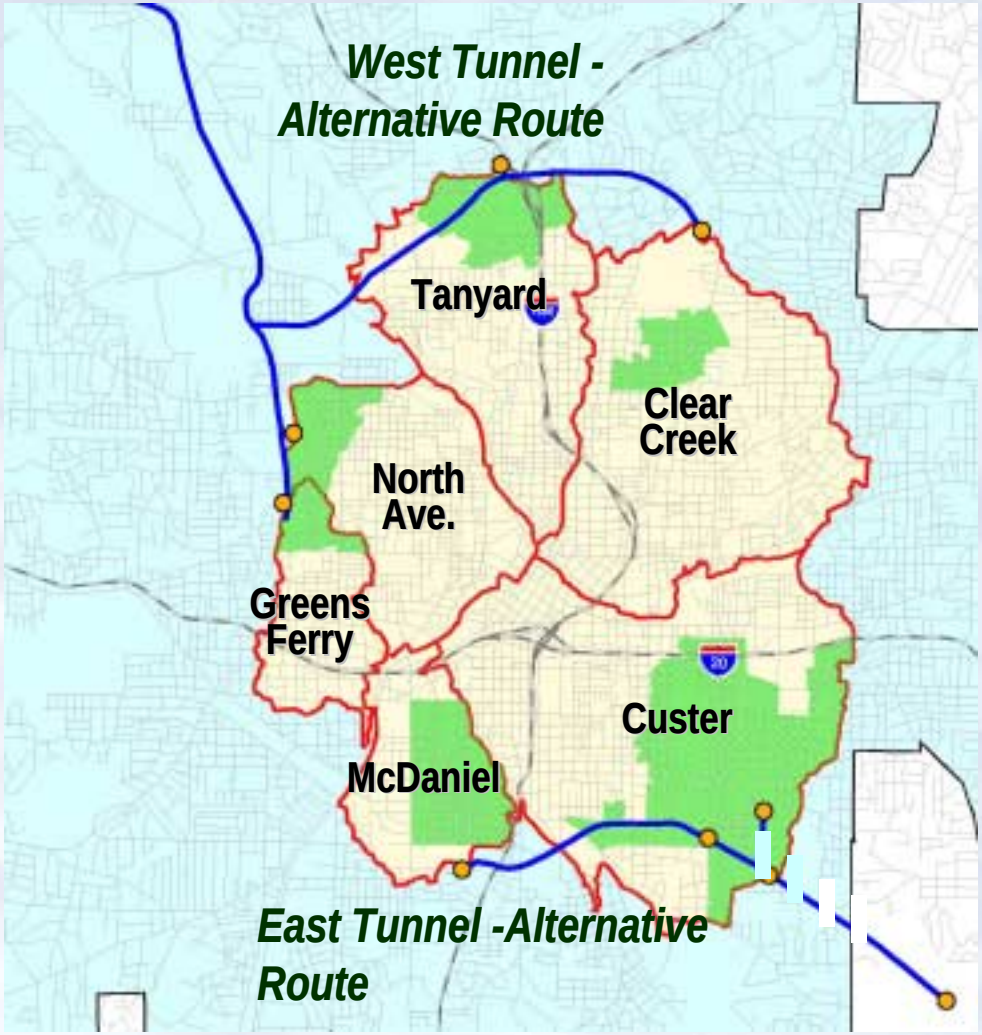


# Authorized Plan: Partial Sewer Separation (27%), Tunnel Storage & Treatment Plants



# Predesign Schedule for Authorized CSO Plan

- EPA/EPD authorized plan July ‘01
- City began predesign process in August ’01
  - Tunnel predesign submitted May ’02
  - East Area CSO Treatment Facility due July ’02
  - Dechlorination for CSO Facilities due July ’02
  - West Area CSO Treatment Facility begins December ’02
  - Sewer separation due September ‘02

# Refining the Authorized Plan

- Focus of refinement is on separation of multiple full CSO basins
  - City's plan did not fully separate any basins or eliminate any CSO control facilities
  - EPA authorization specifically requested City to consider separation of full basins
  - Currently examining separation of multiple full basins to eliminate several neighborhood CSO facilities
- Refinement to be completed in September 2002
  - Separation plan for each combined sewer basin
  - Stormwater management plan for each sewer basin

# Refinement Objectives

- Provide complete response to all issues raised to date by the public participation process
- Develop a refined solution at lower cost with increased benefits – separation of multiple full basins with elimination of CSOs
- Do not impact schedule – implementation by November 2007

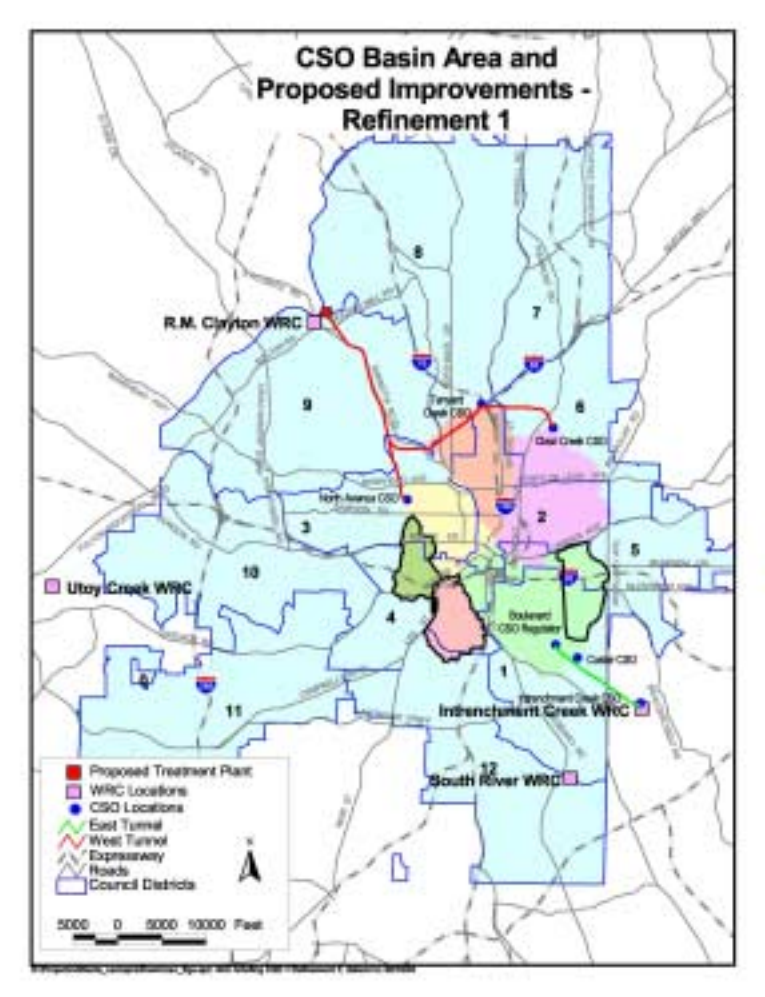
# Criteria Comparison – Sewer Separation vs Tunnel Storage

- Cost
  - Predesign costs to date indicate sewer separation of a full basin costs more than tunnel storage and treatment for a full basin.
- Schedule
  - Sewer separation of multiple basins that do not include the downtown core can be implemented by the 2007 consent decree deadline
  - Sewer separation of multiple basins that include the downtown core cannot be implemented by the 2007 consent decree deadline
- Water Quality
  - Sewer separation treats 100% of wastewater (no CSOs) and 0% of stormwater
  - Tunnel storage treats 98% of wastewater (4 overflows / yr) and 85% of storm water (annual volume captured by tunnel)
- Quality of Life
  - Sewer separation of a full basin eliminates a CSO -- a benefit

# Example Refinements to CSO Authorized Plan

A. Refinement 1

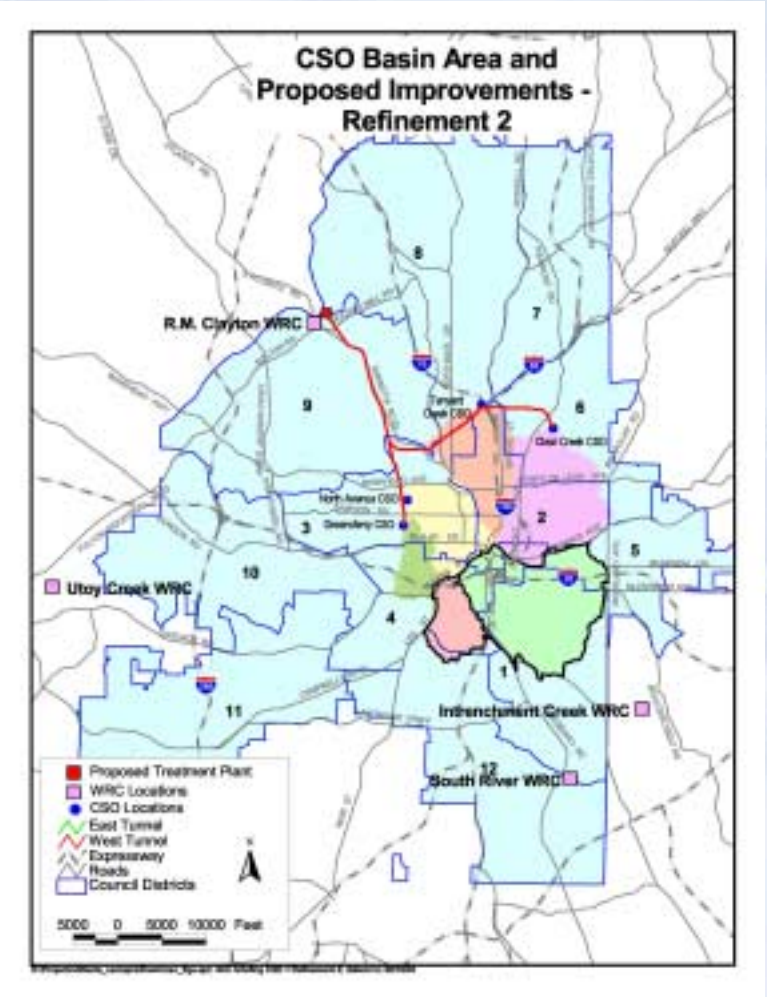
- Fully separate Greensferry, McDaniel and Stockade basins (27%)
- Reduce length and volume of tunnel storage
- Eliminate 2 CSO facilities and 1 regulator
- Estimated capital cost likely less than authorized plan
- Can likely be constructed by 2007



# Example Refinements to CSO Authorized Plan

B. Refinement 2

- Fully separate the East Area (McDaniel and Custer basins -- >40%)
- Eliminate East Area tunnel storage system
- Eliminate East Area combined sewer treatment plant (Intrenchment)
- Eliminate 2 CSO facilities and 2 regulators
- Estimated capital cost likely about same as authorized plan
- Can likely be constructed by 2007 (very little downtown core)



# Example Refinements to CSO Authorized Plan

C. Other possible refinement scenarios

# Refined Authorized Plan offers Short and Long Term Benefits

- Short-Term
  - Combination tunnel storage and treatment and separation of multiple full basins (excluding downtown core) can be implemented by 2007
- Long-Term
  - The tunnel storage and treatment portion of the refined plan can provide long-term combined sewage treatment (98% wastewater, 85% stormwater)
  - Should the future bring full sewer separation, the tunnel storage and treatment system becomes a long-term stormwater management system, treating 85% of the stormwater from the worst water quality stormwater (basins that include the downtown core).
  - The full value of the capital asset can then be transferred to a future storm water utility (no loss of asset value).

# Consent Decree Does Not Address

- ***Total cost***
- ***Sources of funding***
- ***Stormwater management***

# A Significant Financial Challenge (The Big Picture)

- City Investment to date $1.1 Billion

- City Investment from 2002 to 2014 (est.)
  - CSO Remedial Plan $1 Billion
  - SSO Remedial Plan $1 Billion
  - Regulatory & Other $1 Billion

Total $3 Billion

# Affordability Analysis

- City developed a financial and affordability analysis in accordance with EPA Guidance Document
- City made initial submittal June ’01 and a final resubmittal February ’02
  - Confirmed previous conclusion of “high burden rating”
- EPA final determination received June ’02
  - Rated as “medium burden”

# City's Position on Stormwater Management

- Stormwater management is part of the City's long-term watershed enhancement program
- Stormwater management improvements will not be implemented under the refined authorized plan
  - Adds >$1 billion to total cost
  - Not required by Consent Decree
  - Using water and sewer revenue funds places an unfair burden on residential ratepayers, especially seniors, fixed/low income, families
  - Water and sewer revenue funds cannot be used for stormwater improvements (City Legal Dept)
- City plans to implement a stormwater utility
  - Stormwater improvements would be more appropriately funded based on percentage of impervious area – ***"Those who pave, pay"***

# Next Steps

- Complete predesign in September ’02
  - Mayor’s Advisory Panel on Clean Water
  - Citizen’s Advisory Committee (NPU Environmental Chairs)
- Refinements must be approved by EPA/EPD
- Final design scheduled to begin December ‘02
- Construction must start by March 2004 to meet November 2007 CD date
- Submit request to EPA/EPD for a 10-year implementation period because of medium burden rating